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PRELIMINARY SCOPING STUDY

PAKISTAN'S CLEAN ENERGY TRANSITION:

THE ENABLING ROLE OF FINANCIAL INSTRUMENTS



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Preliminary Scoping Study

Pakistan's Clean Energy Transition: The Enabling Role of Financial Instruments

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Abbreviation	Full Form
SBP	State Bank of Pakistan
SECP	Securities and Exchange Commission of Pakistan
NEPRA	National Electric Power Regulatory Authority
IMF	International Monetary Fund
ADB	Asian Development Bank
UNDP	United Nations Development Programme
CPEC	China-Pakistan Economic Corridor
Exim Bank	Export-Import Bank of China
CDB	China Development Bank
NDCs	Nationally Determined Contributions
IFRS	International Financial Reporting Standards
ESRM	Environmental & Social Risk Management
GBGs	Green Banking Guidelines
VRE	Variable Renewable Energy
ESG	Environmental, Social, and Governance
NPMV	Non-Project Missed Volume
PPP	Power Purchase Price
IPPs	Independent Power Producers
KIBOR	Karachi Interbank Offered Rate
LIBOR	London Interbank Offered Rate
SMEs	Small and Medium Enterprises
JETPs	Just Energy Transition Partnerships
ETM	Energy Transition Mechanism
BRI	Belt and Road Initiative
IFC	International Finance Corporation
WAPDA	Water and Power Development Authority
RESCO	Renewable Energy Service Company
BOT	Build-Operate-Transfer
FiT	Feed-in Tariff
PPA	Power Purchase Agreement
DFI	Development Finance Institution
MTV	Managed Transition Vehicles
OPIC	Overseas Private Investment Corporation
TCX	The Currency Exchange Fund
PRGs	Partial Risk Guarantees
CCCI	Coal to Clean Credit Initiative
RE	Renewable Energy
NTDC	National Transmission and Despatch Company
DISCOs	Distribution Companies
SEZs	Special Economic Zones
BISP	Benazir Income Support Programme
ESCOs	Energy Service Companies
SOEs	State-Owned Enterprises
MRV	Monitoring, Reporting, and Verification

ABSTRACT

Despite its substantial renewable energy potential, Pakistan's clean energy transition faces significant financing challenges. This paper explores the landscape of financing mechanisms available for facilitating the shift towards clean energy, with a focus on current gaps, existing policies, and innovative models. It critically examines domestic and international financial instruments, including public funding, concessional loans, blended finance, and green bonds, while analyzing the role of key stakeholders such as the government, development partners, and the private sector. Drawing upon policy documents, secondary data, and international best practices, the study outlines a way forward to improve energy access, reduce emissions, and attract private investment. Recommendations include streamlining regulatory frameworks, strengthening the role of development finance institutions, expanding risk mitigation tools, and promoting bankable clean energy projects. The paper provides actionable insights for aligning Pakistan's energy financing with its climate and development goals.





1. INTRODUCTION

Financial institutions, particularly banks, are central to addressing the high upfront costs of energy transitions by mobilizing resources, de-risking investments, and developing innovative financing solutions. With energy transitions carrying high upfront costs, the role of financial institutions becomes crucial in mobilizing the resources required to drive this shift. Pakistan's energy sector faces profound structural and financial hurdles. The circular debt crisis, now exceeding PKR 5.4 trillion, has placed immense strain on the energy system, limiting the ability to invest in renewable energy (NSPP, 2024). At the same time, reliance on imported fossil fuels continues to drive up costs, making energy unaffordable for many and perpetuating inefficiencies. In this environment, financial institutions have a unique opportunity, and responsibility, to support the transition by providing affordable and innovative financing solutions. Policy rates, currently at 13%, while lower than in recent times, still create challenges for long-term investment in clean energy (SBP, 2024). Tailored financial instruments, such as concessional loans, risk-sharing mechanisms, green bonds, de-risking instruments, and some of the alternate financing mechanisms such as ETM, and JETPs provide structured pathways to align investments with sustainability goals, ensuring an efficient and equitable energy transition.

By providing capital, reducing risks, and aligning investments with global frameworks, financial institutions play a fundamental role in the energy sector transformation. However, besides financial resources, this shift requires a concerted effort to build institutional capacity, align fiscal policies to encourage investments, and promote collaboration between domestic and international stakeholders. This role goes beyond facilitation; their active involvement is essential to build a sustainable energy future for Pakistan. Though efforts are being made by the commercial banks, especially around solar financing, the capacity issues around structured mechanisms persist and need further in-depth analysis.

Against this backdrop, the study aims to assess the financing landscape for clean energy in Pakistan, identifying some of the potential financing instruments, key opportunities, challenges, and policy measures to accelerate the transition. It explores mechanisms to mobilize resources, reduce risks, and create a more conducive environment for renewable energy development. It further examines economic prospects, financing barriers, and innovative financial instruments to support a sustainable energy transition.

Key objectives:

- To assess existing financing mechanisms, trends, and gaps in renewable energy investment, highlighting financial sector barriers that limit capital flow.
- To analyze the potential of financial instruments and policy frameworks to attract private sector investment by reducing risks and improving project bankability.
- To propose targeted reforms for financial innovation, strengthen risk mitigation mechanisms, and improve an overall investment climate for a sustainable and inclusive clean energy transition in Pakistan.



2. METHODOLOGY

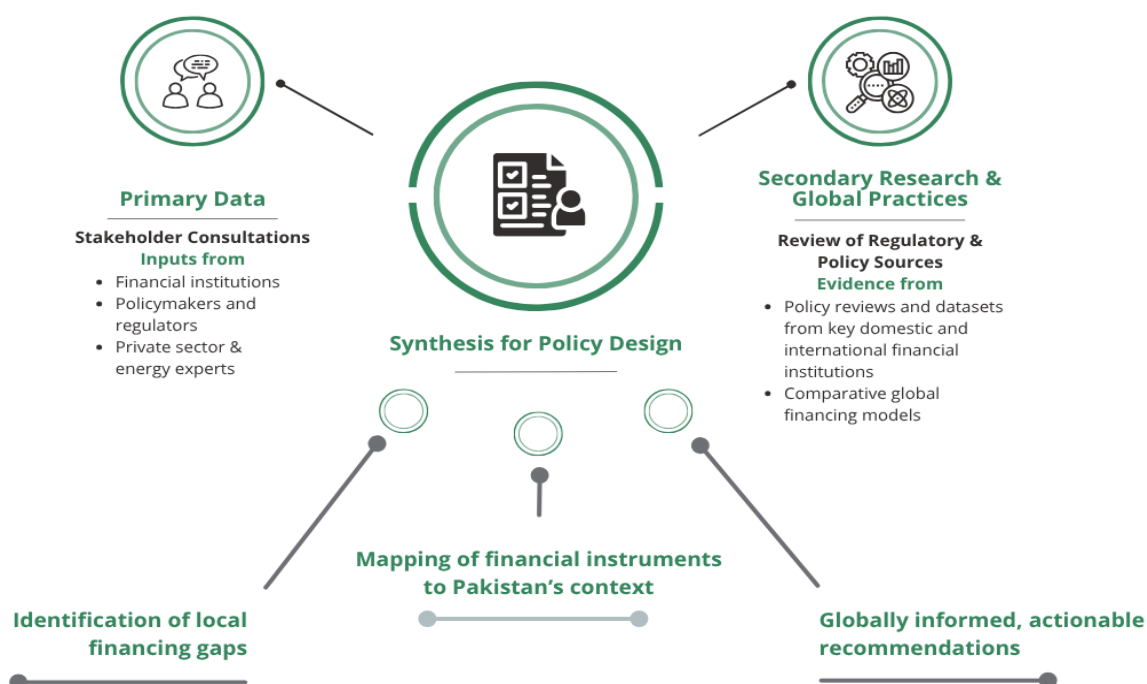


Figure 1: Methodological approach for the study

This study is based on qualitative data primarily derived from a consultative dialogue titled '**Financing Mechanisms for Enabling Clean Energy Transition in Pakistan**'. The dialogue brought together a diverse group of stakeholders, including representatives from financial institutions, policymakers, regulators, energy and finance experts, and private sector actors. Their insights formed the basis of the analysis, offering practical understanding of the opportunities and constraints in financing clean energy projects in Pakistan. To support and contextualize these findings, the study also draws on secondary sources such as SBP, SECP, and NEPRA. International sources, including publications and data from IMF, ADB, UNDP, and the World Bank were referenced to situate Pakistan's financing landscape within broader global trends and best practices. This multi-source, stakeholder-informed approach provides a comprehensive understanding of the clean energy financing landscape and informs the policy recommendations proposed in this paper. The study's methodological framework is outlined in Figure 1.



3. ASSESSMENT OF FINANCING LANDSCAPE FOR CLEAN ENERGY

3.1 Opportunities

Cost Competitiveness of Renewables

Pakistan's transition to renewable energy is essential for reducing electricity costs and enhancing energy security, as solar and wind power offer some of the most cost-effective alternatives to expensive fossil fuel-based electricity. As of 2024, wind and solar energy offer the lowest tariffs and long-term affordability. In contrast, fossil fuel-based power costs much more (Kiani 2024). Variable Renewable Energy (VRE) by World Bank (2020) locational study proposed that the renewable energy can reduce reliance on costly fossil fuels, stabilize electricity prices, and help Pakistan save up to \$5 billion over the next 20 years, by cutting carbon emissions.

Mitigating Export Risks

Pakistan's renewable energy transition provides plenty of opportunity to safeguard its export-driven industries, particularly textile, from regulatory risks under the EU's Carbon Border Adjustment Mechanism (CBAM). Pakistan's National Grid is 1.8 times more carbon-intensive than the EU's, which will significantly impact export competitiveness (as shown in Figure 2) (World Bank 2023). As a result, exports could face a substantial cost increase, threatening their position in international markets. Decarbonizing the power sector by expanding renewable energy adoption can mitigate these risks, ensuring compliance with global trade regulations and maintaining market access.

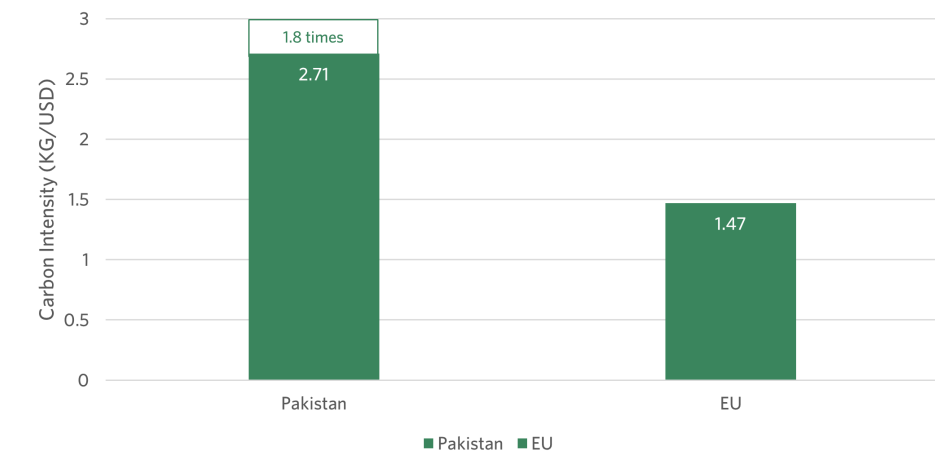


Figure 2: Relative Carbon Intensity of Pakistan's Export
Source: World Bank, 2023

Pakistan's Solar Rush

Pakistan is experiencing a rapid shift toward decentralized solar energy, with solar PV imports from China reaching \$2.1 billion in FY24 (Renewables First and Herald Analytics 2024). In just 18 months, the country imported 22 GW of solar panels, including 13 GW in the first half of FY2024 alone due to strong consumer demand for cost-effective clean energy (Yousafzai 2025) (Sprung and Khan 2024). The cost of clean power technologies such as wind, solar and battery technologies is expected to fall further by 2-11% in 2025, which may provide a significant opportunity for targeted financial interventions to further accelerate this transition sustainably, making solar adoption more accessible for households and businesses (Bloomberg NEF 2025).

Growing Role of Financial Institutions

The increasing emphasis on sustainable lending by financial institutions can be a golden opportunity in the way of Pakistan's RE transition. Regulatory bodies like SECP are strengthening environmental, social, and governance (ESG) disclosure requirements and promoting green financing instruments such as green bonds and sustainability-linked loans, creating a more structured and transparent environment for clean energy financing.

SECP issued guidelines on green bonds in 2021 and introduced an ESG regulatory roadmap in 2022, setting specific targets to integrate sustainability into the regulatory framework. In 2024, the SECP also introduced ESG disclosure guidelines, requiring companies to disclose greenhouse gas emissions, energy consumption, climate risks and mitigation policies, sustainable sourcing and emission reduction strategies. While these guidelines are currently mandatory for listed firms and voluntary for others, ongoing efforts aim to align them with Pakistan's NDCs and encourage broader corporate participation in achieving net-zero targets.

To strengthen corporate accountability, the SECP has also amended the Code of Corporate Governance, making boards responsible for overseeing sustainability priorities and mandating the establishment of dedicated sustainability committees. Additionally, the launch of ESG Sustain, a centralized reporting portal, facilitates disclosure processes and ensures consistency in sustainability reporting.

Furthermore, banks operating in Pakistan are increasingly required to align their financial reporting with international sustainability standards, including the IFRS on climate-related disclosures. The SECP has notified the adoption of IFRS-S1 (Sustainability-related Financial Information) and IFRS-S2 (Climate-related Disclosures), recommended by the Institute of Chartered Accountants of Pakistan (ICAP), to enhance transparency and accountability. These standards aim to provide consistent and comprehensive information to investors, lenders, and other stakeholders for a better assessment of sustainability risks. Following extensive consultation, the SECP has decided to implement these standards for listed companies in a phased approach, based on criteria such as total assets, turnover, and number of employees. The first phase begins with annual reporting periods starting from July 1, 2025 (Business Recorder, 2025).

Additionally, **SBP** has already launched the **ESRM manual**, a procedural guide for **banks and Development Finance Institutions (DFIs)** to incorporate environmental and social risk considerations into their financial decision-making processes. The ESRM framework is aligned with **SBP's Green Banking Guidelines (GBGs)** and provides structured mechanisms for banks to assess sustainability-related risks when financing projects (SBP, 2022). These measures are expected to enhance corporate accountability, improve investor confidence, and facilitate greater capital flows into Pakistan's clean energy sector.

While Pakistan's domestic financial landscape is adapting to sustainability imperatives, international financing—particularly from China—also presents a significant avenue for expanding clean energy investments. Given China's evolving approach to energy financing, there is a strategic opportunity for Pakistan to engage with institutions that prioritize renewables and shift financial flows away from carbon-intensive projects.

China has been Pakistan's largest investor in the energy sector. Between 2005 and 2024, China invested almost USD 68 billion in the country's economy, with energy dominating 74% of the investment portfolio under CPEC project (Isaad and Sayed, 2025). With an energy portfolio worth USD 21.3 billion, CPEC initially prioritized power generation projects heavily reliant on coal (as shown in figure 3 and 5).

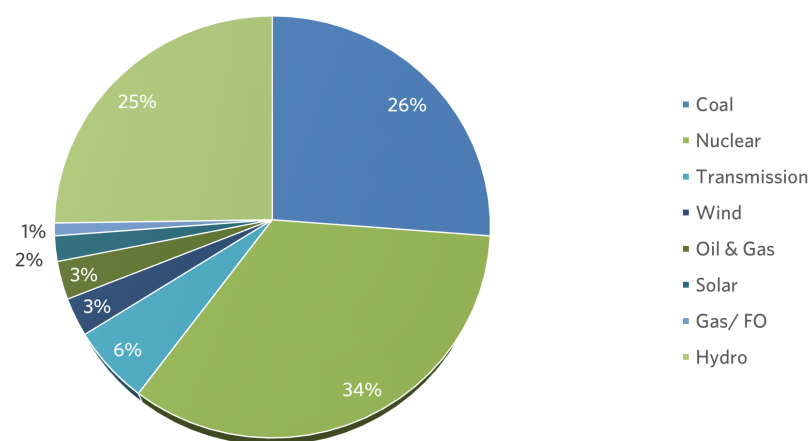


Figure 3: Chinese Fuel-wise Investment in Energy Sector
Source: SDPI

The Exim Bank of China and CDB remain the largest financiers, collectively accounting for nearly 70% of total Chinese investments in Pakistan’s energy sector (see figure 4). However, while China’s Ministry of Commerce and the Bank of Jiangsu have invested in wind energy, overall renewable energy investments remain limited compared to coal and hydro. Given China’s dual governance philosophy—balancing development ambitions with industrial priorities—there is an opportunity for Pakistan to engage Chinese banks that support renewable energy and build a bankable case for green investments.

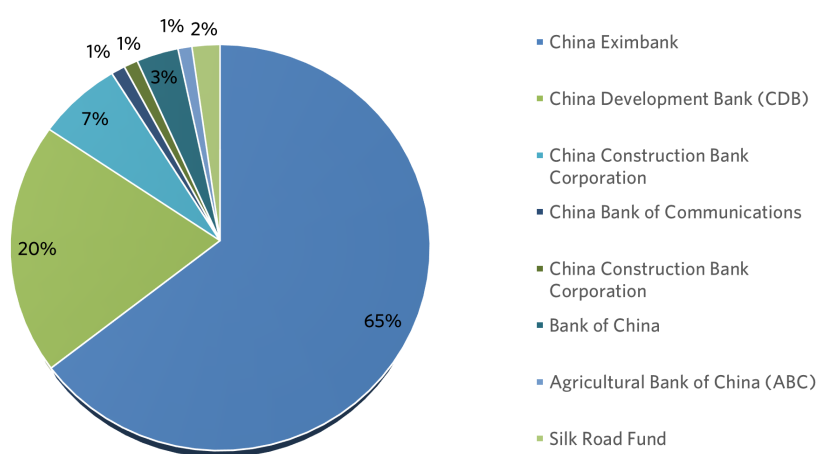


Figure 4: Chinese Banks’ Investments in Pakistan’s Energy Sector
Source: SDPI

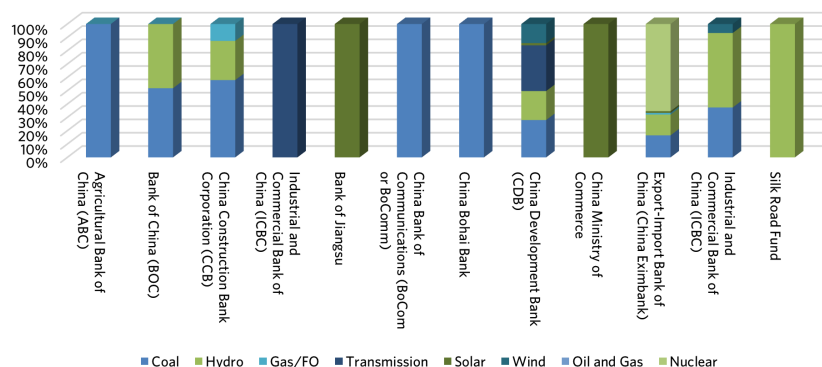


Figure 5: Chinese Banks Fuel wise Investments in Pakistan's Energy Sector

Source: SDPI

This signals an opening for Pakistan to proactively position its renewable energy projects for future Chinese investments. By leveraging its green taxonomy and aligning financial regulations with China's evolving sustainability priorities, Pakistan can attract greater clean energy financing. Establishing direct engagement with banks that are already investing in renewables and strengthening financial cooperation mechanisms will be critical to this effort.

3.2 Key Challenges

Risk-Averse Banking

- Pakistan's financial sector does not face a major liquidity shortage but a de-risking challenge that restricts lending to productive sectors. As of September 2024, commercial banks held total cash deposits of Rs 31.342 trillion, yet as of November 2024, the Advance-to-Deposit Ratio (ADR) stood at 47.8%, up from 41% earlier in the year (Akhter 2024; Hanif 2024). However, this remains significantly lower than other developing economies such as Bangladesh and India that is 88% and 75% respectively (PwC, 2024). This persistent gap in credit allocation represents a significant untapped funding potential of approximately \$25 billion, which could be channeled into sectors like infrastructure, clean energy, and SME financing.
- Pakistan's banking sector has increasingly prioritized risk-free investments in government securities over development-oriented lending, leading to an Investment-to-Deposit Ratio (IDR) of 88%—substantially higher than India's 24%, Bangladesh's 32%, Kenya's 3%, and Sri Lanka's 42% (PwC, 2024) (see figure 6). The decline of concessional loans, coupled with stringent collateral requirements and high perceived risks, has restricted financing for these sectors. In FY24, banks' lending to the federal government reached Rs 8.5 trillion, crowding out the private sector, while SME lending remained stagnant at only 1.3% of total bank credit, despite SMEs contributing 40% to GDP (Iqbal, 2024; Aurangzeb, 2024).
- By August 2024, commercial banks' lending to the government surged to 100.83% of total deposits, reflecting a preference for low-risk returns over economic expansion (Siddiqui, 2024). This risk-averse banking model limits financing for infrastructure, clean energy, and industrial expansion, slowing Pakistan's economic transformation.

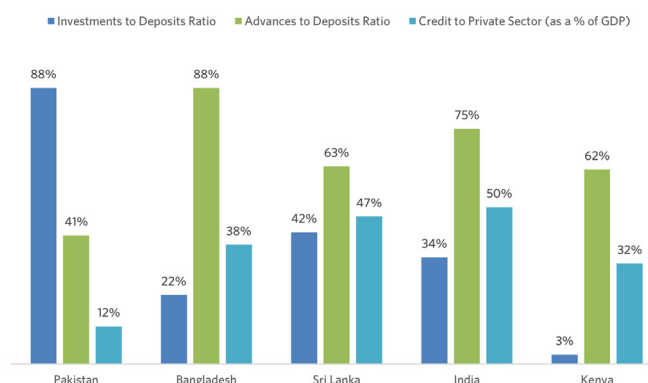


Figure 6: Pakistan's ADR and IDR Compared to Peer Economies

Source: PwC, 2024

Grid Constraints and RE Integration

- Despite rapid growth in solar adoption—16 GW of solar PV imports in 2024 alone—utility-scale renewable energy development remains sluggish. Currently, only 2.6 GW of renewables are installed at the utility scale, and no financial closures have been achieved for new projects in the past three years (Qaseem and Ahmad, 2025).
- Grid inefficiencies are undermining the economic viability of renewable energy in Pakistan. Despite 1,845 MW of installed wind capacity, inadequate transmission infrastructure and poor grid connectivity prevent effective power evacuation, leading to curtailments and significant NPMV (NEPRA, 2024) (as shown in figure 7). In FY24, NPMV losses surged to Rs 39.5 billion—more than triple the Rs 11.8 billion in FY23—placing a growing financial strain on the power sector (NEPRA, 2024). Wind power producers (WPPs) are particularly affected, with continued curtailments rendering projects financially unviable, as highlighted by the Pakistan Wind Energy Association (PakWEA) (Ghumman, 2024).

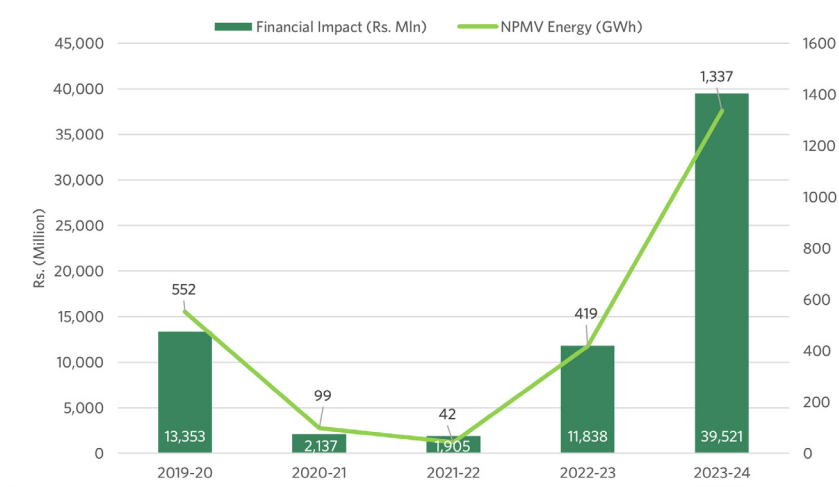


Figure 7: NPMV Trends and Financial Impact FY20-FY24
Source: NEPRA, 2024

- Long-term Energy Purchase Agreements (EPAs) spanning 25 to 30 years have locked Pakistan into rigid commitments, making it difficult for the country to optimize surplus energy. As a result, even as the country increases its renewable energy capacity, such commitments continue to limit its utilization. An IEEFA analysis highlights how long-term, foreign currency-linked Power Purchase Agreements (PPAs) could undermine Pakistan’s solar transition by locking in tariffs for decades, as seen in the 600 MW Muzaffargarh solar project. While reducing the project term from 25 to 14 years would increase the tariff by only 14%, bringing it to 4.6 c/kWh, a further reduction to a 10-year debt servicing schedule would still result in a competitive rate of 5.5 c/kWh. These findings suggest that short-term contracts could provide flexibility while maintaining cost-effectiveness, preventing future solar projects from being priced out of the market. Additionally, Pakistan’s dollar-indexed tariffs expose the country to exchange rate volatility, raising long-term costs in rupee terms and limiting fiscal and planning flexibility (Isaad, 2023).

Structural & Financial Risks

- Grid-contracted capacity through IPPs follows a ‘take-or-pay’ model, leading to high-capacity payments regardless of actual electricity consumption. Capacity charges now constitute 64% of the Power Purchase Price (PPP). As more consumers shift to solar, fixed costs are spread over fewer users, further raising per-unit charges (Bhutta, 2024).
- Macroeconomic dependencies further complicate energy financing. Capacity charges are indexed with indicators like the US CPI, national CPI, KIBOR, and LIBOR. The average capacity tariff for IPPs has increased by approximately 561.2% from Rs. 2.78 per unit in 2015-16 to Rs. 18.39 per unit for FY2025 (Jamal, 2025).



Figure 8: Surge in Sinosure Fee for Gwadar Coal Plant (2018-2024)

Source: NEPRA

- Rising financial uncertainty poses a significant challenge to attracting investment in Pakistan's clean energy sector. This uncertainty has been negatively affecting the investment landscape. For example, the Sinosure fee for the Gwadar coal plant surged from US \$2.1 million in 2018 to US\$ 32.56 million in 2024, as Sinosure grows reluctant to insure further power projects due to mounting investment risks and overdue payments on existing CPEC projects (Jamal, 2024) (as shown in figure 8). Frequent renegotiations of power agreements have also eroded investor confidence. For instance, past renegotiations resulted in a tariff reduction of less than PKR 2 per unit, yet significantly damaged investor confidence (Jamal, 2025). International lenders remain cautious due to Pakistan's inconsistent policy environment.

Capacity Utilization & Demand Mismatch

- Pakistan's installed capacity of around 42,000 MW far exceeds actual demand, which fluctuates between 12,000 MW in summer and 8,000 MW in winter (Waleed, 2024). This significant gap highlights that consumption is largely consumer-based rather than industrial or commercial, which would ensure steadier demand. This discrepancy, coupled with underutilized power plants and capacity payments reaching PKR 2.1 trillion in 2024, underscores the need for a strategic shift away from continuous capacity expansion towards optimized resource utilization (Arshad, 2024). Mechanisms such as early retirement, contract renegotiation, and plant repurposing should be explored to manage financial risks effectively.

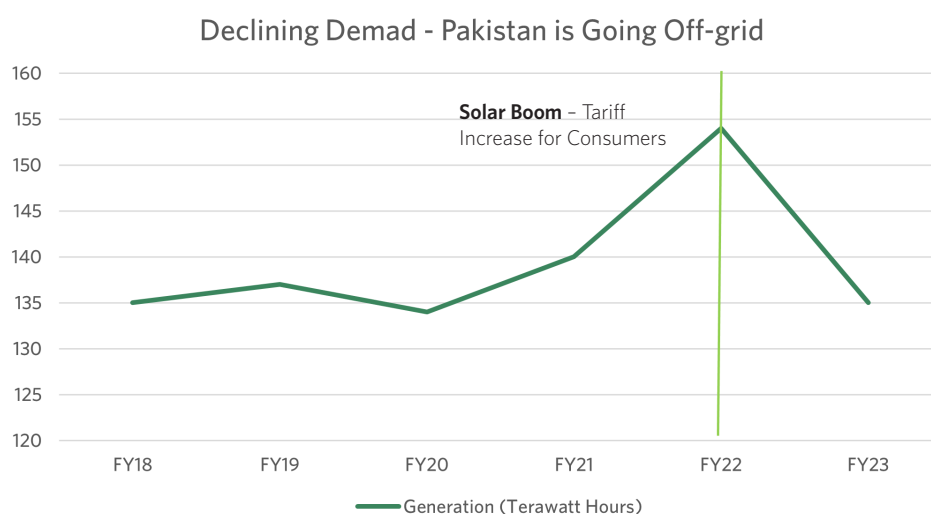


Figure 9: Pakistan's declining grid demand given increase in off-grid systems

Source: NEPRA

- As rooftop solar adoption grows, grid demand is further shrinking, shifting financial burdens onto non-solar consumers (see figure 9). In FY 2023-24, PKR 200 billion in grid fixed costs were passed on to non-solar users, increasing their tariffs by PKR 2 per unit. Further solar penetration could reduce grid demand by 10%, pushing base tariffs up by 17% and shifting PKR 261 billion annually onto non-solar customers. Without reforms, utilities risk a “death spiral,” where reduced sales lead to higher tariffs, driving more consumers off-grid and worsening financial instability (The cost of solar 2024). To sustain the energy transition, Pakistan must implement strategic policies that balance solar expansion with grid resilience while ensuring a fair cost distribution across all consumers.





4. OPPORTUNITIES AND MECHANISMS FOR SCALING CLEAN ENERGY FINANCING

This section outlines strategic avenues through which Pakistan can mobilize financial resources, attract private sector investment, and address structural inefficiencies in its renewable energy sector. Each subsection highlights a specific financial tool or policy mechanism that has successfully supported clean energy transitions globally and offers clear applicability to Pakistan's energy landscape.

4.1 Green Bonds and Blended Finance

Green bonds and blended finance mechanisms play a critical role in reducing investment risks and improving capital access for renewable energy projects. Given the limited private sector participation in Pakistan's clean energy sector due to high perceived risks, these instruments can help bridge the financing gap. Green bonds are debt instruments issued to finance environmentally sustainable projects such as renewable energy, energy efficiency, sustainable infrastructure, and climate resilience. Issued by sovereign entities, municipalities, or corporations, they typically attract a broad base of environmentally conscious investors and can reduce borrowing costs due to the premium placed on sustainability-focused assets (World Economic Forum 2024).

Several developing countries offer successful precedents. Nigeria, in 2017, became the first African country to issue a sovereign green bond, raising \$29.7 million for renewable energy and afforestation projects. The issuance attracted international investors, diversified Nigeria's investor base, and lowered borrowing costs, leading to subsequent issuances (Federal Government of Nigeria 2018). Similarly, Fiji, the first emerging economy to issue a sovereign green bond, raised \$50 million for climate resilience and clean energy, gaining visibility on international platforms such as the London Stock Exchange and expanding its access to global capital markets (Arqam 2025). Indonesia's issuance of the world's first sovereign Green Sukuk in 2018 raised \$1.25 billion to finance climate-resilient infrastructure and renewables, while tapping into Islamic capital markets and showcasing a model highly relevant for Pakistan, given its large Islamic finance sector (Green Finance Platform 2018).

Pakistan can draw further lessons from China's Green Bond Model, which has successfully financed renewable energy projects both domestically and offshore. By 2023, the Industrial and Commercial Bank of China (ICBC) had issued nine overseas green bonds worth \$19.9 billion, including \$2.03 billion in BRI-themed green bonds. It also established a Green Bond Framework to fund eligible projects in renewable energy, clean transportation, and sustainable water management. The bank's Green Bond Framework prioritizes financing for wind, solar, clean transportation, and sustainable water projects, with its green bond portfolio including 43 wind power projects valued at US\$ 3.1 billion and eight solar projects worth US \$ 971 million. (ICBC, 2024). Pakistan, as a key BRI partner, could leverage similar financing mechanisms to fund large-scale renewable energy projects while aligning its infrastructure investments with global sustainability standards.

Similarly, Masdar, a leading renewable energy company, has issued green bonds to finance renewable energy expansion, raising US\$ 750 million in green bonds to support renewable projects in Uzbekistan, Azerbaijan, and the UAE. The projects, totaling 3.7 GW of capacity, are expected to mitigate 5.4 million tons of greenhouse gas emissions annually. In 2024, it issued a second US\$ 1 billion green bond to fund solar, wind, battery storage, and transmission projects (Levesque, 2024).

Pakistan has already ventured into the green bond market with the Water and Power Development Authority (WAPDA) issuing its first green Eurobond, Indus Bond, raising US \$500 million at a competitive 7.5% interest rate. The bond attracted significant investor interest, with bids reaching US\$ 3 billion—six times the required amount. However, Pakistan's deteriorating credit rating and economic instability have since stalled further issuances. WAPDA has delayed its second green Eurobond due to foreign exchange restrictions and declining investor confidence, underscoring the need for macroeconomic stability and policy consistency to sustain green bond market momentum (Waleed, 2023).

Blended finance de-risks renewable energy investments by combining public and private capital, attracting commercial lenders and mobilizing institutional investment. By leveraging concessional funding, credit guarantees, and risk-sharing mechanisms, it lowers borrowing costs and mitigates financial uncertainty.

Multilateral institutions, including International Finance Corporation (IFC) and Global Innovation Fund (GIF), have successfully deployed blended finance to support clean energy transitions in emerging markets. Pakistan can adopt similar models by partnering with development finance institutions (DFIs), providing credit guarantees, and structuring investment vehicles to crowd in private capital.

Case Study: IFC's Scaling Solar Programme - A Model for Blended Finance and Rapid Solar Deployment

The International Finance Corporation's (IFC) Scaling Solar programme offers a compelling model for accelerating solar energy deployment through blended finance, standardized processes, and risk mitigation. Designed as a "one-stop-shop," the programme provides governments with project preparation and structuring support, while offering developers certainty, low transaction costs, and bankable project documentation.

Scaling Solar integrates multiple World Bank Group services, including technical advice, tender management, standardized project documents, stapled financing, risk management products, and political risk insurance. This comprehensive approach aims to deliver competitively priced solar energy from private IPPs within two years of project launch.

The programme's success is evident in Sub-Saharan Africa, where countries like Zambia, Senegal, and Madagascar have signed up, resulting in mandates for over 1,200 MW of solar capacity, securing over US \$100 million in financing, including US\$ 50 million mobilized by the IFC. In Zambia, Scaling Solar facilitated the development of two solar PV plants with a total capacity of 88 MW. The programme reduced tariffs to as low as US¢ 6.015 / kWh, attracting new investors and encouraging African governments to prioritize solar energy. These projects were financed through a blend of IFC loans, concessional loans from the Canada Climate Change Program, and political risk insurance from the Multilateral Investment Guarantee Agency (MIGA) (IFC, 2019).

4.2 Public-Private Partnerships (PPPs) for Energy Sector

PPPs have played a crucial role in scaling energy infrastructure globally through private sector investment and expertise. Successful regional examples include India's Renewable Energy Service Company (RESCO) model which has facilitated large-scale solar deployment by allowing private solar developers to finance, own, and operate solar projects while selling electricity to consumers. India's adoption of the RESCO model, particularly in Madhya Pradesh, has demonstrated its potential for achieving low-cost solar tariffs and attracting domestic and international investment. The model has been recognized as a scalable innovation by India's Capacity Building Commission, with significant potential for replication (Yeshwanth, Mumtaz and Saha, 2024). Pakistan can adopt such models to scale distributed solar as it has successfully utilized Build-Operate-Transfer (BOT) models for coal and gas projects such as the Sahiwal Coal Power Plant under CPEC.

Table 1: Achievements of RESCO Model in Madhya Pradesh

Source: ADB

Item	Particulars
No. of trees cut reduced	2.5 Million (annually)
CO ₂ avoidance	60,000 tons (annually) up to December 2021 (analyzed by MIS of MPUVNL)
Quantity of power generated	200,000 units (kWh) from July 2020 to May 2023 amounting to \$80,000
Coverage of institutions	643 sites covered
Average tariff achieved	per kWh; minimum rate achieved is \$0.017 per kWh

For Pakistan to successfully implement such models, it must ensure economic viability by offering tangible cost savings, strengthen contract bankability through effective payment security mechanisms, and avoid reliance on subsidies that can undermine investor confidence. Subsidies should be approached cautiously, as delayed disbursements can harm investor trust; instead, ensuring competitive tariffs through market-driven pricing is key. Regulatory flexibility, particularly in capacity restrictions and metering policies, is essential—Pakistan should explore gross metering models that align incentives for both consumers and DISCOs. Additionally, establishing a dedicated anchor agency to facilitate demand aggregation, streamline bidding, and support private developers will be key to scaling distributed solar (Yeshwanth, Mumtaz and Saha, 2024). A stable

regulatory framework with credit guarantees, power purchase agreements (PPAs), and tax incentives is vital for attracting private investment and expanding PPPs in the energy sector.

Pakistan's experience with upfront feed-in tariff (FiT) contributed to just 829 MW of wind and 480 MW of solar capacity between 2013 and 2022. However, its abrupt expiration in 2016 disrupted investor confidence, whereas Vietnam's FiT facilitated 18.5 GW of installations, largely driven by SME participation (Isaad, 2023a). Since then, competitive bidding has been mandated for renewable energy, but its auction framework needs refinement to enhance inclusivity and competition. High administrative costs and entry barriers currently favour large-scale developers, limiting SME participation. To address this, the government should prioritize non-cost objectives like local industry growth and job creation while streamlining the bidding process. Lower bid bonds, extended realization periods, and preferential tariffs for community projects—similar to Germany's 2017 wind auctions, where citizen projects secured 80% of capacity—can encourage broader participation (Amjad, 2023). Additionally, diversifying project locations and reducing concentration risks will ensure a more equitable distribution of renewable energy benefits.

4.3 Debt-for-Nature and Climate Swaps

Pakistan's high sovereign debt burden—external publicly guaranteed (PPG) debt reaching PKR 26 trillion (24.5% of GDP) by June 2024—limits fiscal space for clean energy investments (Finance Division, 2024). However, debt-for-nature and climate swaps present a viable solution, allowing Pakistan to negotiate debt relief in exchange for commitments to climate action and renewable energy financing. With multilateral institutions and Paris Club members holding a significant portion of Pakistan's external debt, these mechanisms provide an opportunity to restructure repayments while mobilizing resources for climate action.

Table 2: Decomposition of Pakistan's Public Debt - Key Creditors

Source: (IMF, 2024)

Creditor Type	Debt Stock (US\$ million)	Percent of Total Debt (%)	Percent of GDP (%)
Multilateral Creditors	\$102,743	40.5	30.4
- IMF	\$7,596	3	2.2
- World Bank	\$46,059	18.3	13.7
- ADB/AIIB/ADB	\$15,367	6.1	4.5
Bilateral Creditors	\$41,591	16.4	12.3
- Paris Club	\$7,591	3	2.2
- Japan	\$3,246	1.3	1
- France	\$1,317	0.5	0.4
Non-Paris Club	\$34,000	13.4	10.1
- China	\$23,651	9.3	7

Several countries have successfully implemented debt swaps as a financing mechanism for sustainability and climate goals. Several countries have successfully leveraged debt swaps to finance environmental initiatives, demonstrating creditor willingness to explore innovative debt restructuring mechanisms. The Belize debt-for-nature swap enabled the country to repurchase \$553 million of debt at a 45% discount, using a \$364 million credit-enhanced blue loan backed by the US International Development Finance Corporation (IDFC). The savings were redirected into marine conservation initiatives, ensuring long-term environmental benefits. Similarly, Seychelles executed a \$21.6 million bilateral debt swap under Paris Club, redirecting funds into a national climate adaptation trust to provide structured financing for conservation efforts (UNDP, 2023) (Figure 10 shows the structure of Seychelles' debt-for-nature swap).

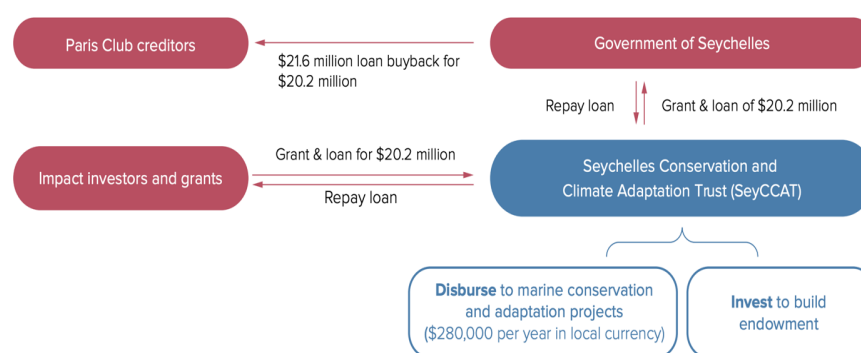


Figure 10: Seychelles debt-for-nature swap

Source: (UNDP, 2023)

Pakistan's largest creditors, including IMF and Paris Club members, have engaged in similar negotiations globally, demonstrating creditor willingness to explore innovative debt restructuring mechanisms. Germany has been a global leader in debt-for-development swaps, launching 72 initiatives between 1992 and 2010, totaling €150 million annually for eligible low- and middle-income countries. France's Debt Reduction-Development Contract (C2D) has mobilized €5.4 billion for infrastructure, vocational training, and agriculture across Africa and Latin America. Japan carried out debt-for-health swaps with Nigeria and Pakistan, linking concessional loan repayments to achieving polio immunization targets (UNDP, 2023).

Pakistan has also previously engaged in debt-for-development swaps, demonstrating its capacity to integrate SDG-aligned debt restructuring (UNDP, 2023). Examples include:

- Pakistan-Germany (2005, 2010): €166 million in debt cancellation for investments in education, health, and infrastructure.
- Pakistan-Italy (2001, 2009): US\$185 million in debt relief, supporting Afghan refugee-related projects and socio-economic development.
- Pakistan-Canada (2005-2011): CAD\$449.6 million converted into education sector investments.
- Pakistan-Norway (2006): €20 million redirected for earthquake rehabilitation.
- Pakistan-Belgium (2007): €10 million allocated to ADB's Pakistan Earthquake Fund.

Given Pakistan's substantial debt obligations to these creditors, their historical engagement in debt swaps, and Pakistan's own precedent with SDG-linked restructuring, there is a strong case for Pakistan to pursue debt-for-climate restructuring, repurposing debt obligations toward clean energy investments. Additionally, Pakistan could explore alternative finance mechanisms such as the IMF's Resilience and Sustainability Trust (RST), which provides long-term, affordable financing for climate resilience in vulnerable low- and middle-income countries (LMICs). The RST could complement Pakistan's debt restructuring efforts by integrating climate-linked financial support into its fiscal management strategy.

4.4 Debt-for-carbon swaps

Debt-for-carbon swaps are sovereign debt restructuring instruments that allow countries to reduce external debt in exchange for verified reductions in greenhouse gas emissions. Creditors agree to cancel or refinance part of the debt if the debtor undertakes projects such as retiring coal plants or deploying renewable energy that produce measurable emission cuts. These avoided emissions are monetized through carbon markets or recognized as global public goods, offsetting the debt value. Unlike debt-for-nature swaps, which focus on conservation, debt-for-carbon swaps directly link financial relief to decarbonization outcomes.

These swaps create fiscal space, reduce emissions, and offer repayment assurance to creditors. They are particularly relevant for countries with limited access to carbon markets and high debt vulnerability. With proper systems for emissions verification and carbon accounting, they can attract bilateral lenders, DFIs, and private investors.

Global experience with debt-for-carbon-like structures is expanding. Indonesia's Energy Transition Mechanism (ETM), led by the Asian Development Bank, exemplifies many of the key features of a debt-for-carbon swap. The ETM combines concessional finance and blended capital to retire coal power plants ahead of schedule, with the resulting avoided emissions factored into the financial design of the initiative. In the Philippines, a proposed ETM platform aims to use carbon-linked revenues to refinance existing sovereign or commercial debt, especially through early coal plant retirement. Costa Rica and Chile have also expressed interest in carbon-based debt relief schemes as part of their national climate finance strategies, often linked to REDD+, renewable energy, or transport electrification (World Bank Group 2025).

Pakistan, with \$28.79 billion in debt to China, much of it tied to coal under CPEC, is a strong candidate for debt-for-carbon swaps (Kiani 2024). Retiring or converting coal plants like Sahiwal and Port Qasim could generate verified emission reductions that support restructuring high-cost Chinese commercial debt. Additionally, such swaps could be supported by international carbon buyers through voluntary carbon markets or multilateral climate funds such as the LEAF Coalition, Climate Investment Funds (CIF), or Green Climate Fund (GCF). Leveraging avoided emissions in this way could help restructure Pakistan's costly short-term commercial loans, particularly the USD 3.5 billion owed to Chinese commercial banks with high interest rates and short tenors (Pakistan Economic Survey, 2024). They would ease debt pressure, support Pakistan's climate targets, and align with global decarbonization goals.

4.5 Just Energy Transition Partnerships (JETPs)

JETPs are multilateral financing arrangements designed to support developing countries in moving away from fossil fuel-based energy systems toward renewable energy in a socially equitable manner. These partnerships pool grants, concessional loans, private investments, and technical assistance from international donors, multilateral development banks, and private sector actors to finance coal phase-out, renewable deployment, and related infrastructure and policy reforms (Shai 2025). A key feature of JETPs is their emphasis on a "just" transition, ensuring that workers, communities, and regions dependent on fossil fuel industries are not left behind. This involves integrating social safeguards, reskilling programs, and economic diversification plans into the financial and institutional design of the transition (Jain & Bustami 2025).

Several countries have already adopted this model. South Africa launched the first JETP in 2021, which secured US\$8.5 billion in initial funding as part of a broader \$98 billion energy transition plan over five years. The JETP framework, supported by the Climate Investment Funds Accelerating Coal Transition Investment Plan (CIF ACT), France, Germany, the UK, US, and EU, provides a structured financing mechanism that Pakistan can replicate to attract concessional funding for coal retirement and renewable energy development (European Commission, 2022). In 2022, Indonesia signed a \$20 billion JETP with a mix of public and private finance to accelerate coal plant retirement and expand solar, wind, and geothermal energy. The agreement also included commitments to policy reform and regulatory alignment. Vietnam followed in December 2022 with a \$15.5 billion JETP aimed at peaking emissions earlier and reducing planned coal capacity, supported by investments in renewable energy and power sector modernization (Jain & Bustami 2025).

4.6. Managed Transition Vehicles (MTVs) and Energy Transition Mechanisms (ETMs)

During July-March 2024, the power sector's coal consumption accounted for 68.9% of total coal usage, with coal-fired plants contributing significantly to the country's 200 million metric tons of CO₂ emissions in 2023 (Pakistan Economic Survey, 2024). With global investors retreating from coal financing, a structured Managed Transition Vehicles (MTVs) and ETM approach can facilitate the gradual phase-out of coal while securing financial support for renewable energy expansion.

MTVs are special purpose vehicles (SPVs) that acquire or refinance coal-fired power plants (CFPPs), phase them down ahead of schedule, and reinvest in renewable energy infrastructure. They pool capital from a mix of investors—public, private, multilateral, and philanthropic—enhanced by concessional finance, guarantees, and grants. By separating coal and renewable energy assets under a single financial architecture, MTVs allow original CFPP owners to stay engaged as equity or debt holders while unlocking new capital through reverse auctions for solar or wind projects. The Asian Development Bank (ADB), through its Energy Transition Partnerships, is already evaluating the feasibility of MTVs in Pakistan, positioning the country to take early advantage of this emerging model (Nedopil, Ang & Hyder 2024).

Energy Transition Mechanisms (ETMs), pioneered by the Asian Development Bank (ADB), specifically focus on leveraging concessional financing, guarantees, and market incentives to retire coal assets ahead of their scheduled lifespans. The ETM structure incorporates a “carbon reduction fund” to retire existing coal plants, alongside a “clean energy fund” explicitly dedicated to financing new renewable energy capacity, grid upgrades, and associated transition costs (International Labour Organization 2022).

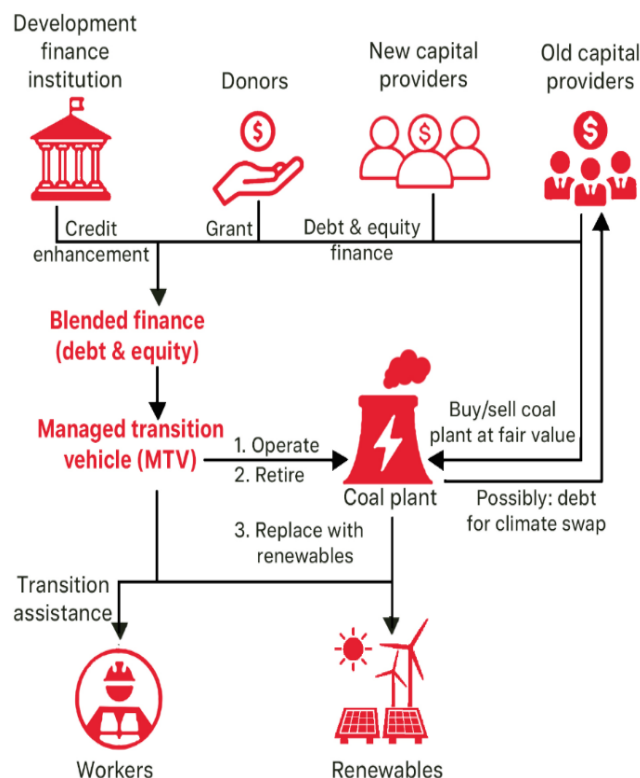


Figure 11: MTV with combined coal and renewable PPA

Source: Nedopil, Ang & Hyder (2024)

The Philippines adopted an Energy Transition Mechanism (ETM) in 2021 with support from the Asian Development Bank to retire coal plants ahead of schedule and replace them with clean energy. The model pools concessional loans, grants, and private capital into a dedicated fund, reducing investment risk through guarantees and blended finance. It also includes social protections like reskilling and transition funds for coal-dependent communities (Asian Development Bank 2021). Indonesia, through its JETP, is implementing Managed Transition Vehicles (MTVs) that acquire and retire coal assets early while investing in renewables. These MTVs blend public, multilateral, and private finance and allocate funds for economic diversification and employment transition, providing a practical, scalable model for coal phase-out.

Pakistan should pursue long-term decarbonization by piloting a Managed Transition Vehicle (MTV) for Chinese-financed coal plants. A model combining equity from plant owners, Sinosure-backed guarantees, concessional AIIB loans, and philanthropic grants could retire a 1 GW coal plant 28 years early while financing 3 GW of renewables. According to new calculations, refinancing and phasing down coal plants like SSRL, Engro Thar, and Sahiwal could increase their enterprise value after 12 years—without even accounting for renewable revenue—due to lower-cost refinancing. Pairing this approach with a debt-for-climate swap would allow partial cancellation of coal-linked commercial debt, reduce sovereign risk, and attract green-aligned capital. To enable this, Pakistan must auction land for renewable parks, engage utilities like PEPCO, and coordinate with Chinese SOEs and banks on asset transfers (Nedopil, Ang & Hyder 2024).

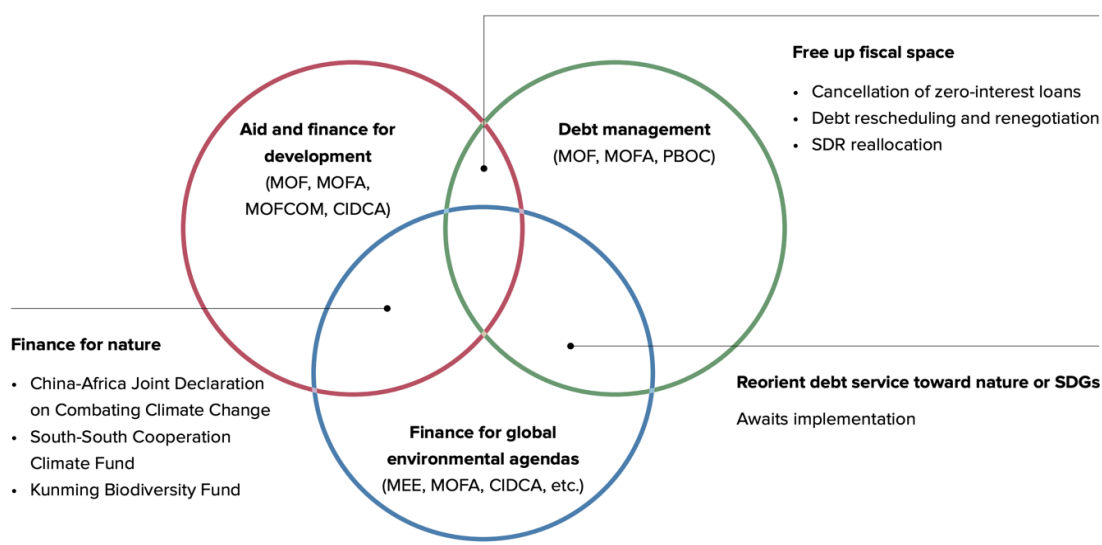


Table 3: Enterprise value through refinancing for three different Chinese-sponsored Pakistani coal-fired power plants

Source: Nedopil, Ang & Hyder (2024)

Plant	Business as usual	Refinance & retire
SSRL (1320 MW plant commissioned in 2023)	USD 2.19 billion	USD 2.62 billion
Engro Thar (660 MW plant commissioned in 2019)	USD 844 million	USD 944 million
Sahiwal (1320 MW plant commissioned in 2017)	USD 1.61 billion	USD 1.65 billion

Organizations such as Rockefeller Foundation are already financing coal retirement projects in Vietnam and the Philippines, using carbon financing to decommission plants early and transition to renewable energy (Reccessary, 2023). Pakistan should actively engage with similar philanthropic and impact investment funds to secure financing for coal decommissioning and clean energy expansion.

4.7. Strengthening Green Finance Mechanisms with China

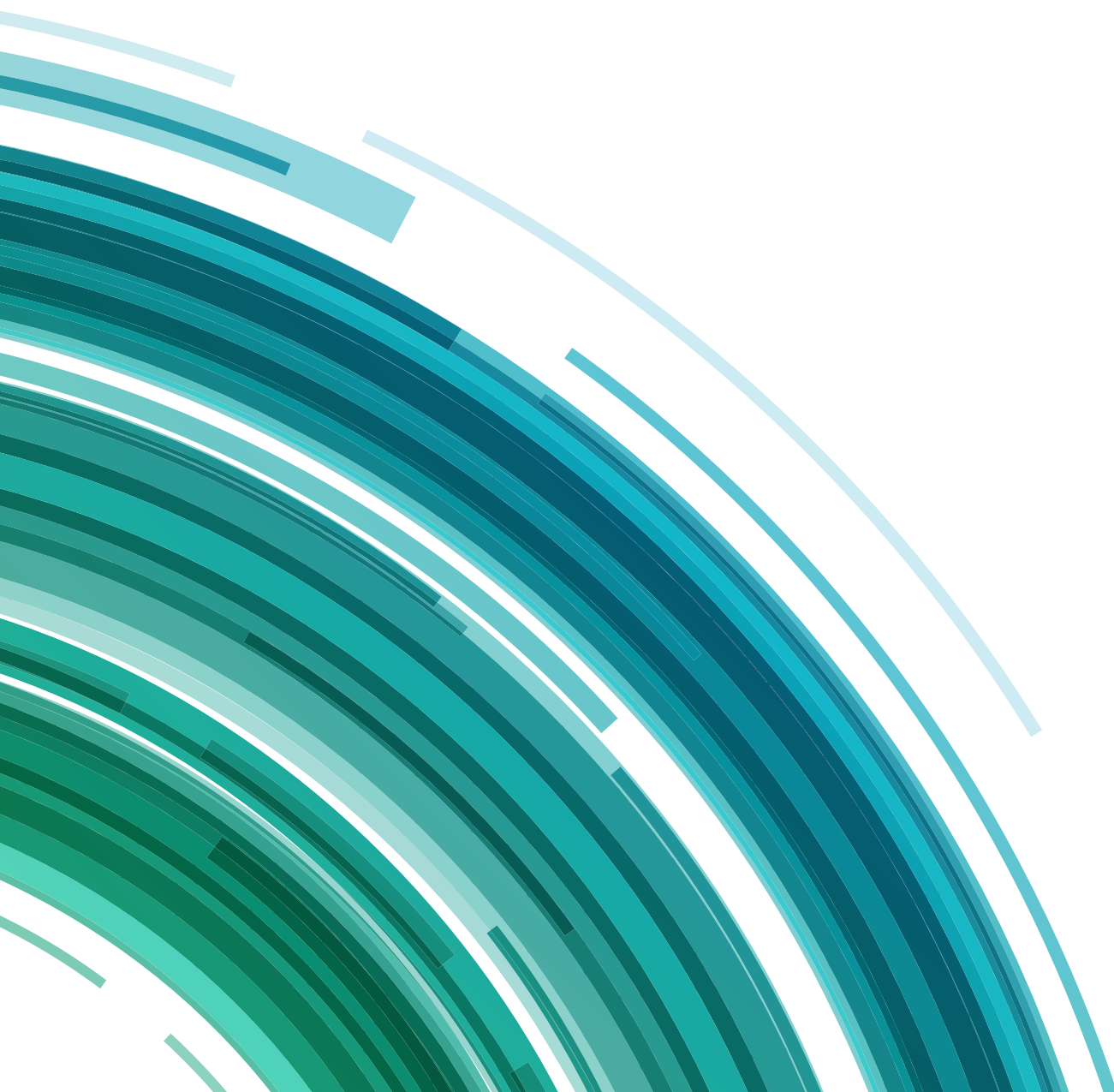
With China as Pakistan's largest creditor, holding 22% of its external debt (approximately \$29 billion), there is growing potential for bilateral financial cooperation in green finance and debt restructuring (Kiani, 2024). While China has not yet engaged in large-scale debt-for-nature or debt-for-climate swaps, its evolving approach to green finance presents new possibilities. China's involvement in multilateral initiatives, such as the Debt Service Suspension Initiative (DSSI), under which China suspended 63% of all eligible debt service payments between 2020 and 2021 and the China-Africa Joint Declaration on Combating Climate Change (2021), where China committed to supporting green infrastructure, renewable energy, and climate adaptation in partner nations, suggests a growing willingness to integrate sustainability into its financing strategies (UNDP, 2023).

This policy shift aligns with China's broader adoption of international green finance standards, including those set by the International Finance Corporation (IFC), which prioritize climate-conscious investment. This shift provides an opening for Pakistan to engage with China on debt restructuring options that align with green development goals. This shift is reinforced by recent bilateral renegotiations that illustrate China's flexibility with strategic partner countries. In the case of Sri Lanka, facing a severe debt crisis, China restructured substantial portions of its bilateral debt in 2023–2024 by extending maturities and converting some high-interest loans into concessional financing. The deal aimed to reduce immediate debt service pressures while preserving long-term geopolitical and economic cooperation (Mallawarachi 2024). Similarly, Ecuador successfully refinanced \$4.4 billion of Chinese debt in 2022, extending repayment terms and securing more favorable conditions through bilateral talks with China Development Bank and the Export-Import Bank of China (Reuters 2022). These examples underscore China's growing openness to flexible, development-aligned debt restructuring.

For Pakistan, this creates a clear opening to negotiate bilateral debt-for-nature swaps by engaging Chinese institutions in reorganizing CPEC-related concessional loans. Restructuring efforts could redirect debt-service payments toward renewable energy investments, structured within China's preference for bilateral agreements and aligned with CPEC's evolving green finance vision. Pakistan can also advocate for stricter environmental and governance standards in CPEC projects to align with global sustainable finance trends and improve investor confidence.

Beyond bilateral debt restructuring, Pakistan can integrate into China's broader Belt and Road Initiative (BRI) green finance mechanisms by leveraging the "1+9" recommendations from the Green Development Guidance for BRI Projects. This framework emphasizes reducing climate and eco-environmental risks in overseas financing through a project classification system that categorizes projects based on their environmental impact. It may involve differentiated conditions—such as environmentally harmful projects face higher interest rates, incentivizing sustainability (BRIGC, 2023). By leveraging BRIGC's Green Development Guidance, Pakistan can promote climate risk assessments and sustainable financing mechanisms to enhance its attractiveness for green investments within the BRI framework.

China's sovereign risk management strategy is also evolving, shifting from politically driven government-to-government loans toward market-based project financing. This presents an opportunity for Pakistan to diversify its financing strategies and tap into private sector funding for green investments. The plan of issuance of Panda Bonds this year, aiming to raise between \$200-\$250 million from Chinese investors, also presents an opportunity to secure financing for the energy sector (Panda Bonds 2025). Linking these bonds to sustainable projects, as seen in Egypt's model, which sold 3.5 billion yuan in 3-year sustainable panda bond in its debut issue will enhance their attractiveness to environmentally conscious investors and support Pakistan's transition toward cleaner energy sources.





5. POLICY RECOMMENDATIONS AND THE WAY FORWARD

5.1 Creating a Stable and Predictable Investment Environment

A stable and predictable investment environment is critical for attracting long-term capital and reducing financing costs for renewable energy projects in Pakistan.

Policy Stability and Risk Mitigation

- **Clear and consistent renewable** energy policies are necessary to ensure long-term investor confidence. Vietnam's feed-in tariff (FIT) programme, which attracted \$7.4 billion in solar investments, demonstrates how policy certainty can drive large-scale clean energy deployment (Isaad, 2023a). Political risk insurance can further mitigate regulatory uncertainties. Kenya's 100 MW Kipeto Wind Project, backed by OPIC insurance, secured financing despite high investment risks, offering a model for Pakistan (Gebrial, 2014).
- **Foreign exchange and interest rate fluctuations increase financing costs for renewable projects.** Kenya's TCX Fund successfully mitigates such risks, attracting long-term private investment in local currency. Establishing a similar risk-hedging mechanism in Pakistan would stabilize clean energy financing and improve investor confidence.

De-Risking Investments and Strengthening Financial Institutions

- Investment risks can be reduced through targeted financial instruments. PRGs can play a critical role in enhancing investor confidence by mitigating risks related to payment defaults and policy uncertainty. Pakistan can introduce similar mechanisms in collaboration with the State Bank, World Bank, and international financial institutions (IFIs) to de-risk renewable energy investments and encourage private capital inflows.
- Pakistan's banking sector must play a more **active role in financing clean energy projects**. Banks should be mandated through SBP directives to allocate funds for clean energy and SME financing, leveraging treasury expertise for development-oriented investments. Structural reforms, such as relaxing the Statutory Liquidity Ratio (SLR), can enable banks to invest in productive sectors rather than relying on government securities.
- **Strengthening advisory capacity within financial institutions** will improve lending decisions and ensure better coordination between banks, government bodies, and external experts. Specialized advisory groups should integrate international best practices in project appraisal and risk management to align financing strategies with long-term energy transition goals.
- **Formally engage institutions** like AIB, Sinosure, and other multilateral guarantee providers to design credit-enhanced financing frameworks for clean energy and transition-linked infrastructure.
- Developing innovative banking instruments that align profitability with economic growth is also crucial. Policies that **incentivize commercial banks** to invest in renewable energy will help drive private-sector participation and scale clean energy financing.
- Design and implement a **competitive reverse auction framework** for utility-scale renewable energy PPAs to lower costs, enhance transparency, and ensure bankable revenue streams for investors.

5.2 Strategic Integration and Targeted Interventions

Clean energy financing must align with Pakistan's broader industrial, energy, and fiscal policies to ensure long-term viability and maximize impact.

Decommissioning Fossil Fuels

- Pakistan must prioritize **retiring fossil fuel-based power plants** to create space for renewable energy investments. Without decommissioning thermal capacity or significantly increasing demand, new wind and solar projects will not be economically viable. A structured phase-out plan for coal and oil-based plants should be developed to optimize energy generation while maintaining grid stability.
- Since many of Pakistan's coal plants are relatively new, **early retirement under JETPs** is financially challenging. Instead, Pakistan should explore the Coal to Clean Credit Initiative (CCCI), which provides carbon credits for coal plant retirements rather than only financing new renewable projects. This approach aligns with the country's economic feasibility and emission reduction goals.
- Facilitate **coordinated public-private investment efforts** to aggregate blended capital for clean energy investments and coal plant retirement, integrating concessional finance, sovereign guarantees, reverse auctions, and carbon-linked revenue streams.

Scaling Small-Scale Renewable Energy & Local Solutions

- Given that the large-scale projects face financing challenges, **small-scale RE projects**, including mini grids, microgrids, and community grids, offer a viable alternative without requiring NTDC, DISCOs, or government intervention. A localized, small-scale RE approach will improve energy access, stimulate economic growth, and create employment while reducing Pakistan's dependence on expensive fossil fuel imports.

Promoting Sustainable Practices & Green Technologies

- Carbon pricing remains an option, but voluntary carbon markets no longer provide credits for standalone renewable energy projects. To overcome this challenge, Pakistan should **integrate solar and wind projects with nature-based solutions**, such as mangrove afforestation powered by solar energy, to increase eligibility for carbon credits and enhance financial viability.
- With abundant silica reserves, Pakistan can develop a **domestic solar manufacturing industry** by facilitating technology transfer, localized manufacturing, and financing mechanisms. However, certification challenges—such as IEC61215 compliance—must be addressed. If international certification is not feasible, Pakistan should develop local quality control standards to ensure long-term solar panel efficiency.
- **Sector coupling** and distributed generation should be prioritized to enhance energy efficiency and support industrial decarbonization. Green hydrogen production in SEZs near Thatta can utilize existing capacity while promoting industrial growth. Establishing a Power-to-X (P2X) Alliance, involving industries and business chambers, can facilitate energy integration strategies, leveraging green hydrogen, electrification, and energy storage technologies.

Aligning Renewable Energy Policy with Market Realities

- Pakistan must **align policy frameworks with ground realities** to ensure effective solar adoption. Currently, rooftop solar installations operate on a self-initiative basis, leading to challenges such as tariff losses for the government and grid destabilization due to uncoordinated solar consumption patterns. A comprehensive policy is needed to integrate distributed solar generation, ensuring grid stability and financial sustainability in the power sector.
- **Addressing the subsidy burden is critical**, as Pakistan currently spends PKR 90 billion per month on

protected consumers. Shifting to a targeted subsidy model through BISP would reduce this cost to PKR 48 billion, saving PKR 43 billion per month (Bhutta 2024). These savings can be reinvested into tailor-made solar panel solutions for protected consumers, supported by concessional financing schemes such as the State Bank of Pakistan's RE financing programmes.

- The upcoming **Green Taxonomy by the State Bank of Pakistan** should classify renewable energy projects as eligible for concessional financing and risk mitigation, improving investment attractiveness.
- Commission **investment-grade pre-feasibility studies** on early retirement and refinancing of priority coal plants to inform bilateral discussions with China and multilateral partners.

5.3 Enhancing Financial Sector Capacity and Innovation

The financial sector must evolve to effectively evaluate, finance, and manage renewable energy projects.

Promoting Innovative Financing Mechanisms

- Expanding **alternative financing models** can unlock private capital for renewable energy deployment. Crowdfunding platforms can facilitate small-scale investments in solar and wind projects, enabling wider public participation. Additionally, blockchain-based financing can enhance transparency and streamline investment flows by digitizing transactions and contracts.
- Pakistan's local banks have already demonstrated success in **financing small-scale RE projects**, like the Grameen Bank model, which has enabled decentralized solar adoption in rural areas. Strengthening these financial mechanisms will empower small businesses and communities to invest in renewables, supporting inclusive energy transition efforts.

Shifting to Positive Screening Mechanisms

- Traditional banking risk assessments often deter investments in renewables by focusing on short-term risks rather than long-term economic and environmental benefits. Pakistan must **shift from negative to positive screening**, ensuring financial institutions prioritize projects that contribute to CO₂ reduction, community benefits, and economic growth.
- To incentivize clean energy financing, the government should introduce **preferential lending rates for renewable energy projects** and require commercial banks to dedicate a minimum percentage of lending portfolios to green investments. Such mechanisms have been successfully implemented in countries like Bangladesh, where green banking policies have spurred private sector RE investments.

Strengthening Institutional Capacity & Green Finance Partnerships

- A robust **regulatory framework and strong PPPs** are critical for scaling green finance. SECP must expand its green finance initiatives, ensuring strong ESG frameworks, sustainability-linked financing, and disclosure requirements. Establishing bank advisory groups to integrate the best global practices in project appraisal and risk management will help bridge the expertise gap in evaluating renewable energy projects.
- **Strengthen institutional capacity** within the Ministry of Finance, Power Division, and Planning Commission to design and execute complex clean energy finance instruments, through dedicated units or partnerships with DFIs.
- Given SOEs' dominant role in Pakistan's energy sector, **aligning their financial management, governance, and operations with green objectives** is crucial. A structured financial strategy should
- Ensure stable project cash flows by improving financial planning, service delivery, and efficiency to attract clean energy investments. Strategically diversify SOEs' energy portfolios by increasing investments in wind, solar, and hydro while reducing reliance on fossil fuels.
 - » Develop **expertise in green bonds** to ensure compliance with international standards, integrating monitoring, reporting, and verification (MRV) mechanisms to enhance investor confidence.
 - » Develop **training programmes for bank staff** on renewable energy risk assessment and project viability analysis.
 - » Strengthen the **identification and structuring of bankable clean energy projects**, ensuring project viability and alignment with climate finance criteria, which will attract both domestic lenders and international climate funds.

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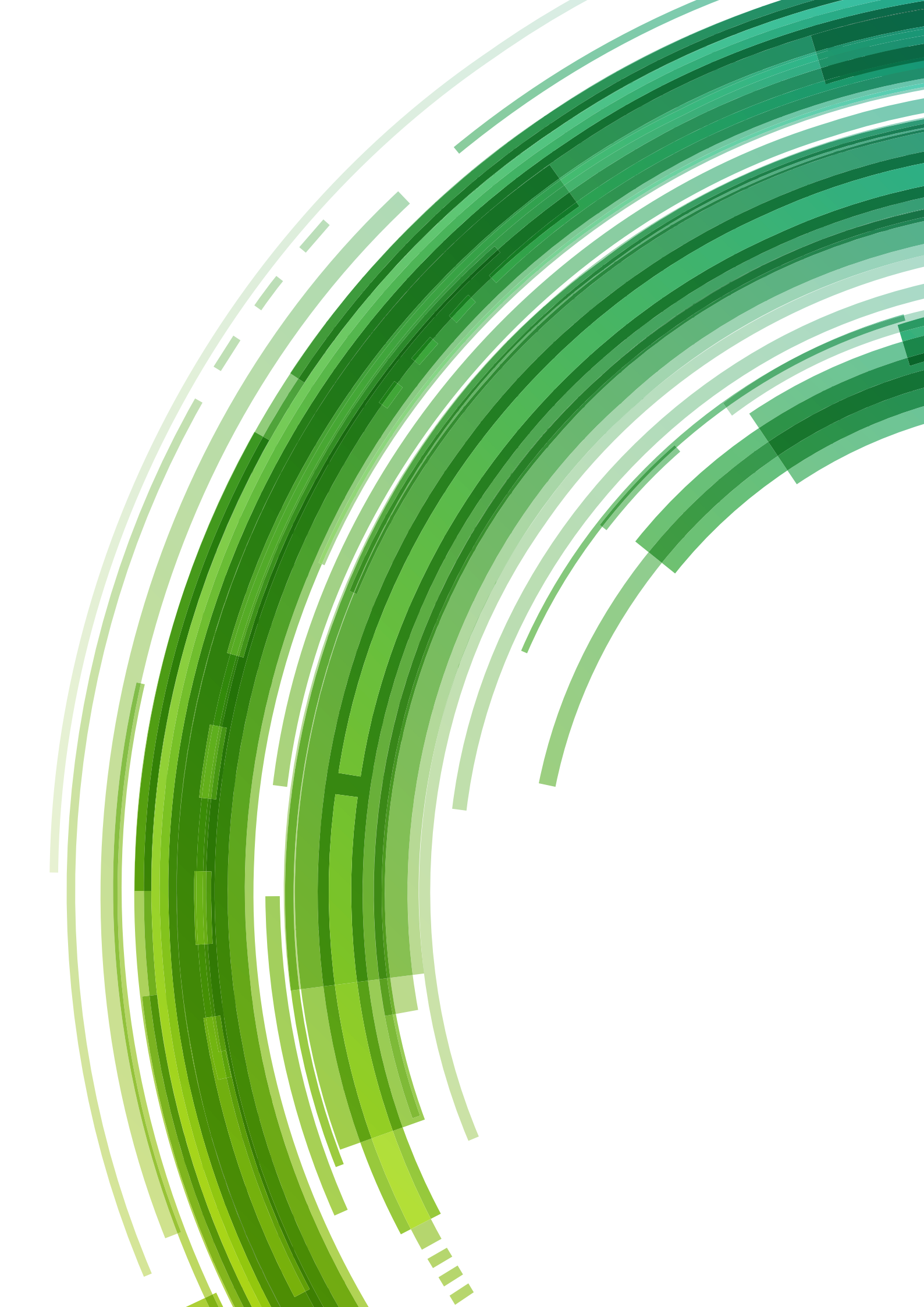
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